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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/590,985	06/09/2000	Harry R. Allcock	9792909-0292	2041

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PATREA L. PABST  
HOLLAND & KNIGHT LLP  
SUITE 2000, ONE ATLANTIC CENTER  
1201 WEST PEACHTREE STREET, N.E.  
ATLANTA, GA 30309-3400

EXAMINER

YUAN, DAH WEI D

ART UNIT	PAPER NUMBER
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1745

17

DATE MAILED: 06/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-17

**Office Action Summary**

Applicati n No.

09/590,985

Applicant(s)

ALLCOCK ET AL.

Examiner

Dah-Wei D. Yuan

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5, 8 and 11 is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 7, 9, 10, 12 and 13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**PROTON CONDUCTING POLYMER MEMBRANES**

Examiner: Yuan      S.N. 09/590,985      Art Unit: 1745      June 16, 2003

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 9, 2003 has been entered. Claims 1,12,13 were amended.

2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action (Paper No. 4).

***Specification***

3. The disclosure is objected to because of the following informalities: The term "oxyacid" is understood as "oxygen-containing acids". However, the characterization of several acids, including cyanic acid and chloric acid, as oxyacid, appears to be inconsistent with the conventional definition. See Page 4, Lines 23-29. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

4. The claim rejections under 35 U.S.C. 112, second paragraph, on claims 1-4,6-7,9,10,12,13 are withdrawn, because the independent claims 1,12,13 have been amended.

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-4,6,7,9,10,12,13 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The definition the term "molecular acid" is not disclosed in the instant specification.

( This deficiency renders the examination impractical because of the critical nature of the  
aforementioned term.) For the interest of compact prosecution, the limitation "wherein the  
oxyacid is a molecular acid" in claims 1,12,13 is not considered.

***Claim Rejections - 35 USC § 102***

7. Claims 1,3,4,6,7,10,12,13 are rejected under 35 U.S.C. 102(e) as being anticipated by Formato et al. (US 6,248,469 B1).

Formato et al. teach a process of making a solid polymer electrolyte membrane that is used in a direct methanol fuel cell. The process involves the steps of preparing a mixture of a polymer substrate and an ion-conducting material in a common solvent and casting a solid membrane from the mixture. The preferred polymer substrates include polyester, polyvinyl, and polystyrene. The preferred solvents include tetrahydrofuran, sulfuric acid, phosphoric acid, chlorosulfonic acid and polyphosphoric acid. The polymer substrate is first dissolved in the

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solvent followed by the drop-wise addition of an acid solution, such as chlorosulfonic acid solution. The reaction is stopped by the additions of deionized water to the mixture. The membrane film is then cast on soda lime glass plate and left to stand in a dry box with a relative humidity less than 5% for a period of 24 hours to remove the organic solvent. See Column 5, Lines 37-40; Column 7, Lines 23-28; Column 8, Lines 13-26; Examples 1 & 4 and Table 7.

***Claim Rejections - 35 USC § 103***

8. Claims 2,9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Formato (US 6,248,469 B1).

The disclosure of Formato et al. differs from Applicant's claims in that Formato et al. do not specifically disclose the amounts of water added to the oxyacid-containing polymer solution. However, it could have been within the skill of the ordinary artisan to adjust the amounts of the water in the mixture depending upon desired reaction kinetics of the mixture. *Discovery of optimum value of result effective variable in known process is ordinarily within skill of art. In re Boesch*, CCPA 1980, 617 F.2d 272, 205 USPQ215.

Moreover, Formato et al. cast the membrane film on a soda lime glass surface instead of a polytetrafluoroethylene surface. Glass and polytetrafluoroethylene are considered to be functionally equivalent. Therefore, it would have been obvious to one of ordinary skill in the art to substitute a polytetrafluoroethylene substrate for the soda lime glass in the process disclosed by Formato et al.

***Allowable Subject Matter***

9. Claims 5,8 are allowed. The invention of independent claim 5 recites a method for making a proton conducting polymeric membrane comprising the steps of dissolving a polymer in an organic solvent wherein the polymer is a polyphosphazene as stated in the claim. The closest prior art of record, Formato et al, does not disclose or suggest a method for making a proton conducting polymeric membrane by using polyphosphazene.

10. Claim 11 is allowed. The following is a statement of reasons for the indication of allowable subject matter: The invention of independent claim 11 recites a proton conducting polymeric membrane comprising a mixture of polyphosphazene and an oxyacid. The closest prior art of record, Formato et al, does not disclose or suggest a proton conducting polymeric membrane comprising polyphosphazene

***Response to Arguments***

11. Applicant's arguments filed on February April 9, 2003 have been fully considered but they are not persuasive.

*Applicant's principle arguments are*

*The oxyacid defined in the claims is a molecular acid rather than a polymeric acid.*

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In response to Applicant's arguments, please consider the following comments.

First, the recitation "oxyacid is a molecular acid" in claims 1,12,13 lacks the support in the disclosure and, therefore, the definition and scope of the term is unclear. Moreover, Formato et al. teach the addition of chlorosulfonic acid, which is not a polymeric acid, to the polymer solution. See Example 4.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (703) 308-0766. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (703) 308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Dah-Wei D. Yuan  
June 16, 2003

